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Universal Banking and the Financing of Industrial Development

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Developing countries designing financial systems should take a lesson from U.S. financial history and avoid a costly, lengthy detour through financial fragmentation.

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Summary findings

In universal banking, large banks operate extensive networks of branches, provide many different services, hold several claims on firms (including equity and debt), and participate directly in the corporate governance of firms that rely on the banks for funding or as insurance underwriters.

Would universal banking be effective in a newly industrializing economy? Does universal banking reduce corporate financing costs for a newly industrializing economy?

Calomiris contrasts the cost of financing industrialization in the United States and in Germany during the second industrial revolution. Between 1870 and 1913, large production and distribution activities brought a new challenge to financial markets: the rapid financing of very large, minimally efficient industries. Large production is typical of modern industrial practice, so the lessons from that period apply broadly to contemporary developing countries.

The second industrial revolution involved many new products and technologies, especially involving machinery, electricity, and chemicals. The novelty of these production processes posed severe information problems for external sources of finance. Firms were producing new goods in new ways on an unprecedented scale. Firms needed quick access to heavy financing from sources whose information and control costs were greater because of the difficulty of evaluating proposed projects and controlling the use of funds.

Finance costs for industry were lower in Germany than in the United States, because U.S. regulations prevented the universal banking from which Germany benefited. High finance costs retarded U.S. realization of its full industrial potential and influenced U.S. firms inefficiently to rely more on raw materials and labor rather than on hard-to-finance equipment (fixed capital). Industrial buildings and equipment are less desirable than materials and accounts receivable for a financially constrained firm, because they are less liquid. The potential to expand quickly and reap economies of scale was greater in German industrialization.

The cost of industrial financing began to decline when institutional changes came about that increased the concentration of financial market transactions. In recent decades, a combination of macroeconomic distress, international competitive pressure, and the creative invention of new financial intermediaries has helped the U.S. financial system overcome the regulatory mandate of financial fragmentation.

This paper — a joint product of the Finance and Private Sector Development Division, Policy Research Department, and the Financial Sector Development Department — was presented at a Bank seminar, "Financial History: Lessons of the Past for Reformers of the Present," and is a chapter in a forthcoming volume, *Reforming Finance: Some Lessons from History*, edited by Gerard Caprio, Jr. and Dimitri Vittas. Copies of this paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Daniele Evans, room N9-061, telephone 202-473-8526, fax 202-522-1955, Internet address pinfo@worldbank.org. November 1995. (20 pages)

Universal Banking and the Financing of Industrial Development

by

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This paper was presented at a World Bank Seminar, "Financial History: Lessons of the Past for Reformers of the Present," and is a chapter in a forthcoming volume, Reforming Finance: Some Lessons from History, edited by Gerard Caprio, Jr. and Dimitri Vittas. The author wishes to thank the participants at that seminar and the editors for their comments.

Table of Contents

In this paper I address three questions about universal banking. First, what is universal banking? Second, why might universal banking so defined be an effective organizational structure for a banking system, particularly in a newly industrializing economy? Third, what is the evidence supporting or contradicting the view that universal banking reduces corporate financing costs for a newly industrializing economy?

I define universal banking as a banking system made up of large-scale banks that operate extensive networks of branches, provide many different services, hold several claims on firms (including equity and debt), and participate directly in the corporate governance of the firms that rely on the banks as sources of funding or as securities underwriters. That is an encompassing, and therefore, narrow definition of universal banking. But it suits my purposes. I will examine the pre-World War I universal banking system in Germany—which satisfies my narrow definition—and explore the synergies among the different clauses in my definition.

To answer the question of whether universal banking reduces corporate financing costs, I will contrast the cost of financing industrialization in the United States and in Germany during the second industrial revolution (roughly 1870-1913). This period is important to examine for two reasons. First, the second industrial revolution involved large-scale production and distribution activities (emphasized by Chandler 1977), which brought a new challenge to financial markets—the rapid financing of very large minimum-efficient-scale industries. Because large-scale production is typical of modern industrial practice, I think that the lessons from the second industrial revolution are broadly applicable to contemporary developing countries.

Second, this industrial revolution involved many new products and new technologies, particularly in the machinery, electricity, and chemical industries. The novelty of these production processes posed severe information problems for external sources of finance. Firms producing electrical machinery, chemicals, and power plants were producing new goods in new ways on an unprecedented scale. The need for quick access to large quantities of external finance was accompanied by greater information and control costs because of the difficulty of evaluating proposed projects and controlling the use of funds.

In the second industrial revolution Germany enjoyed lower industrial finance costs than the United States. High finance costs in the United States reflected the absence of universal banking, prevented by regulatory limits placed on U. S. banks. These high costs retarded industrial growth in the United States relative to its potential, and biased the process away from fixed capital–intensive industrialization toward a greater reliance on raw materials and labor. (A more detailed discussion can be found in Calomiris 1995.)

Measuring the Allocative Efficiency of the Financial System

I define the cost of finance as the shadow cost differential between internal and external funds. Arbitrage ensures that (after controlling for differences in transaction costs, which permit markets to be segmented) expected rates of return are essentially the same after controlling for market expectations of risk. Thus some combination of market segmentation and differences in risk can cause differences in market rates of interest or profit across countries that are unrelated to the allocative efficiency of the financial system.

A better measure of the financial system's ability to allocate funds at low cost is the difference between the costs of external funds (securities issued or loans obtained from intermediaries) and internal funds (accumulated retained earnings). In a frictionless world (a world with perfect information and no

physical transaction costs) this cost differential would be zero. But in a world where information and transaction costs are large, this cost may be high because firms may find it difficult to sell their claims to buyers. The difficulty will appear (in theory) as a wedge in the Euler equation that equates the marginal cost and marginal product of firms' investment projects.

The shadow cost differential is easier to define than to measure. In the case of interest rates on bank loans, for example, it may be very difficult to disentangle the part of the interest rate that is attributable to the information and transaction costs of making and enforcing the loan agreement from the part attributable to the riskiness of the loan. Risk and information costs tend to be positively correlated.

But in securities market transactions it is easier to isolate the shadow cost differential. Calomiris and Himmelberg (1995) argue that investment banking expense as a percentage of the value of securities offered provides a useful (albeit partial) measure of the shadow cost differential between external and internal finance. This measure captures (in present value terms) the difference between the return received by investors (identical across firms ex ante, after adjusting for expected risk) and the cost paid by firms. While there are other costs paid by firms not included in the investment banking cost, this measure captures most of the cross-sectional differences in the shadow cost of issuing securities.

The main component of underwriting cost is the "spread" (or commission) earned by the investment bank. German equity underwriting costs were much lower than those in the United States (tables 7.1-7.3). These reported differences understate the true differences in the allocative efficiency of the two financial systems for two reasons. First, Calomiris and Raff (1995) argue that post-World War I costs in the United States were likely lower than pre-World War I costs, so the measured differences between German and U.S. costs in tables 7.1-7.3 are less than the differences measured during the pre-World War I period.

Second, selectivity bias also leads to understatement of the differences in the costs of bringing equity to market in the two countries. Firms in the United States were much less likely to issue common stock because most found the cost issuance prohibitive. Thus only well-seasoned firms (those with relatively low information and transaction costs) issued stock. From 1900 to 1913 the volume of net bond issues (net of retirements) in the United States was roughly the same as stock issues. During the same period in Germany gross bond issues (which are greater than net bond issues) were only half the volume of equity issues. Moreover, to the extent that equity was issued in the United States during this period, it was typically associated with corporate reorganization, rather than the financing of new capital investment. Looking at balance sheets of nonfinancial corporations in the two countries in 1912, bonds and notes accounted for more than half of the book value of corporate equity in the United States, but only 10 percent in Germany (Calomiris 1995, table 5).

The data on commissions for common stock issues earned by German banks from 1893 to 1913 include all firms in the electrical industry (including manufacturers of electrical equipment and operating power plants) and firms in the metal manufacturing industry whose names begin with the letters A through K (table 7.3). Both of these industries are important producers of new products, and both are central to the second industrial revolution.

The metal manufacturing industry includes many small firms, while the electrical industry is dominated by large firms. Together these two industries can provide some evidence on the role of firm size and issue size in determining bankers' commissions. For both industries I divide the sample into small and large issues (less than or greater than one million marks, which equals $220,000 in 1913 dollars). For metals I also report data for firms with small total capital in 1913 (less than 2 million marks). Bankers' commissions averaged 3.67 percent for the electrical industry and 3.90 percent for metal manufacturing. Commissions on small and large issues are essentially the same: although small

manufacturers' issues show lower average costs, the difference is not statistically significant for this small sample. Metal manufacturing firms with low total capital had average commissions of 4.11 percent, compared with 3.90 percent for the industry as a whole. Again, this difference is small and not statistically significant.

These data support the view that German bank commissions on common stock were roughly 3 to 5 percent, and that they did not vary much by industry, firm size, or size of issue. In sharp contrast to the United States, where small firms paid much higher commissions than large firms (Mendelson 1967; Hansen and Torregrossa 1992; Calomiris and Raff 1995), small German firms in high-growth, capital-intensive sectors were able to issue common stock at the same low cost as large issuers. Thus German capital market efficiency may have been of particular benefit to small, rapidly growing firms in these sectors.

Explaining the United States-German Cost Difference

It is sometimes argued that the greater efficiency of U.S. securities markets compensated for the inefficiency of the U.S. banking system. The cost differences described above demonstrate the fallacy of that argument. Banks and securities markets rely on each other to operate efficiently in a universal banking system—like that of pre-World War I Germany.

In the German universal banking system firms progressed through a "financial life cycle." They began their banking relationship by taking very short-term loans (often carried on the books of the bank as overdrafts) directly from banks. Once a firm's favorable prospects had become sufficiently clear to the bank, the bank would underwrite stock issues for the firm and place those issues within the bank's network of trust customers. Subsequent offerings could be made frequently to those customers, often as rights offerings.

Bank underwriters retained control over the voting proxies associated with those stock issues in their role as trust account managers. The bank operated on both sides of the equity transaction—as underwriter, trust account purchaser, and proxy manager. Just as important, its involvement in the issuing firm predated and followed the underwriting transaction. That meant that the bank knew the firm's track record prior to floating its stock, and remained actively involved in corporate governance by concentrating proxy voting power in the banker's hands.

In the United States this degree of continuity was lacking in firms' financial relationships. But the problem was deeper. Both commercial bank lending and investment bank underwriting were hampered by the fragmentation of the financial system, which made industrial lending and securities underwriting unnecessarily expensive.

Commercial banks were less involved in industrial lending in the United States than in Germany. The lack of involvement was a new development in the United States, particular to the second industrial revolution. Beginning in the 1870s, the money-center banks in the East that had been the main sources of industrial finance during the first wave of industrial growth (1800-1850) changed their orientation toward financing commerce. As Lamoreaux (1994) documents, during the earlier industrialization New England bankers had allocated almost all of their funds to industrial firms owned and operated by bank "insiders" (managers and directors). By the end of the nineteenth century those banks had switched to financing the commercial needs of "outsiders" and had developed commercial lending departments and financial ratio analysis for evaluating these arms-length loans.

Why did this change occur? Lamoreaux convincingly argues that the switch did not reflect, as is sometimes argued, ideological changes or new regulations associated with the "real bills doctrine." Rather, the change in bank orientation reflected the increasing mismatch between the needs of large, "Chandlerian" industrial firms and the resources of small, single-office ("unit") banks. As industrial

firms in new industries developed into large-scale, nationwide producers and distributors, their loan demands rose, but bank regulations that restricted branching and consolidation kept banks small. Banks could not meet the needs of these industrial clients without imprudently concentrating their lending. Some banks tried to expand and lobbied for greater rights to merge and branch. Limited successes were met with large increases in bank profitability, but ultimately banks lost that regulatory battle.

Some scholars have suggested that the decline of bank involvement in industrial finance was not very costly because investment bankers and securities market financing filled the void left by commercial bankers. It is true that J.P. Morgan and his colleagues made important inroads in industrial finance—including the expansion and restructuring of whole industries—and were actively involved in corporate governance of the firms whose finances they arranged (often termed the "Morgan collar"). It is also true that secondary markets for equity transactions were well developed in the United States during this period.

Nevertheless, access to the new investment bankers' brand of "finance capitalism" and to securities markets was severely limited. Only the largest, most established firms (for example, major railroads, utilities, and industrial trusts) participated in the new system, and they were typically limited to issuing investment quality bonds or preferred stock. Common stock issuance to finance new industrial activity was virtually absent (Doyle 1991). As a result, even much later in U.S. history investment banking costs were extremely high compared with those in Germany.

Why was it so difficult for firms to gain access to the securities markets and to the equity market in particular? The cost of investment banking was itself largely determined by the structure of the unit banking system. By restricting the size and geographic network of individual banks, the United States not only limited the opportunities for banks to lend directly to industry, but also raised the cost of underwriting and placing securities.

Indeed, unit banking was the only substantial regulatory impediment to both investment banking and universal banking in the United States. Carrying out commercial bank operations and equity underwriting and investing within the same bank holding company was not prohibited in the United States until the Glass-Steagall restrictions of 1933 (which divorced commercial banking and underwriting) and the Bank Holding Company Act of 1956 (which prohibited bank holding companies from owning equity in nonfinancial firms). But long before these acts, universal banking was effectively prohibited by unit banking.

To understand how unit banking prevented the development of universal banking and raised the costs of investment banking, it is useful to review the operation of the German universal banking system and to consider the sources of synergy between nationwide branch banking and underwriting. Commercial banking and underwriting are less costly when done together. It follows that unit banking's restrictions on the geographic scope and size of bank operations also prevented the development of an efficient system of underwriting, placing, and managing equity issues.

The synergies between commercial banking and underwriting can be divided into three categories: economies of information and control, "brick and mortar" network cost savings, and diversification benefits that reduce intermediaries' costs of funds. In each of these categories limitations on bank branching and consolidation undermine the links between investment banking and commercial banking and lead to higher costs for both activities.

Economies of information and control refer to reductions in the costs of gathering information and controlling management that arise in a universal banking system. For example, a bank that acts as a stockholder of a firm (or as a junior "stakeholder" through its fiduciary capacity as a trust account manager of stock) may be able to lend to the firm at lower cost, either because it already knows a lot about the firm or because its powers as a stockholder permit it to protect its interests as a creditor.

Furthermore, if the firm experiences financial distress, the fact that the banker controls the firm's stock can reduce potential conflicts of interest between stockholders and creditors in developing a reorganization plan.

Much of the research on the benefits of allowing banks to combine equity and debt finance has emphasized these advantages. Similar benefits from allowing banks to own or control shares appear in studies of contemporary Germany and Japan and the pre-Glass-Steagall United States. That research has shown that close multidimensional relationships between banks and firms can reduce the costs of obtaining funds for firms, improve firm performance, make investment decisions less dependent on retained earnings, and make it easier for firms to resolve financial distress. In their study of banking relationships before and after Glass-Steagall, DeLong and Ramirez (1995) found that the value of the banking relationship for the firm was substantially reduced when the relationship narrowed to lending alone.[1]

Information and control advantages may also occur in a dynamic context. During their financial life cycles corporations often progress from reliance on bank loans to the public issuance of common stock. Under universal banking of the German type, the same intermediary can hold the debt of the firm in the early stage of the life cycle, later underwrite shares of the firm, and then control voting proxies for the purchasers of those shares. Empirical evidence suggests that there are information cost advantages to having the same intermediary guide the firm through its life cycle in this way (Slovin, Sushka, and Polonchek 1992; Petersen and Rajan 1994). If the firm's financial service needs change over time, it is economical to give intermediaries the flexibility to provide different services and hold various types of claims on the firm.

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[1]. Additional studies in the same spirit include Hoshi, Kashyap, and Scharfstein (1990, 1991); Ramirez (1995); DeLong (1991); and Gorton and Schmidt (1995).

Brick and mortar network cost savings are those that arise if the same delivery network provides a variety of financial services. This form of savings was very important for reducing corporate finance costs historically. Restrictions on bank networks in the United States made it impossible for banks to operate effectively as universal banks. Using the same branches to provide trust services, place securities in portfolios, lend, and accepts deposits allows brick and mortar costs to be spread across many activities. The cost of providing each service is lower when they are combined within the same intermediary.

A key element of universal banking in the German case—which enabled information cost savings and brick and mortar cost savings from marketing securities—was the bank's involvement on both sides of the securities transactions it oversaw. The bank was an underwriter, a broker, and a trustee of the securities it placed. The bank thus retained an "equity stake" in the corporations whose shares were placed, which gave the bank an incentive to fairly price issues and to use its voting power properly. The bank retained an equity stake in underwritten issues because if firms' shares fared badly, the bank could lose trust customers (and future underwriting business) to its competitors. The cost savings of German universal banking could not have been accomplished if the banks had been required to separate dealing, brokering, and trust activities on individual securities transactions.

Universal banking can promote bank diversification because the income from different financial services are not perfectly correlated. Diversification reduces banks' costs of funds, which thereby reduces the costs banks charge their lending and underwriting customers. White (1986) and Brewer (1989) have argued that the benefits of bank diversification can be substantial, based on evidence of limited universal banking in the United States (both historically and currently). Universal banking promotes diversification because the incomes from the variety of services banks offer are not highly correlated.

Effects of the High Cost of External Finance in the United States

Did the high cost of external finance affect U.S. industrialization? It affected industrialization in at least three areas: the mix of inputs chosen in production, the ability to reap scale economies, and the ability to expand quickly, particularly in international markets.

Recent work on the economics of financing constraints (Carpenter, Fazzari, and Petersen 1994; Calomiris, Himmelberg, and Wachtel 1995; Calomiris and Himmelberg 1995) has emphasized that high financing costs encourage firms to inefficiently substitute material and labor inputs for fixed capital. Industrial buildings and equipment are less desirable inputs than materials and accounts receivable for a financially constrained firm because they are less liquid.

Evidence on the composition of tangible capital in pre-World War I Germany and the United States is consistent with the idea that low costs of industrial finance are reflected in input choices. Compared with Germany, the United States relied more on labor and materials than on hard-to-finance equipment. U.S. nonagricultural growth was more labor intensive and less fixed-capital intensive than that of Germany (table 7.4). During the late nineteenth century U.S. nonagricultural producers increased output and labor at the same rate, but in Germany nonagricultural output rose twice as fast as labor input. Also, the U. S. inventory-to-fixed-capital ratio was much higher than that of Germany during this period (table 7.5).

The potential for expanding quickly and reaping economies of scale was greater in German industrialization. Particularly in the electrical industry, Germany expanded rapidly and took advantage of scale and network economies in constructing its electrical utility industry, while U.S. industry developed inefficiently, as a patchwork quilt (Carlson 1991). Germany exported electrical equipment and set up utilities abroad, while the United States lagged behind.

U. S. Institutional Progress After World War I

Progress in reducing the cost of industrial finance in the United States coincided with institutional changes that increased the concentration of financial market transactions. The first changes occurred in the 1920s. In the face of extreme bank distress many states relaxed branching and consolidation restrictions, and an unprecedented bank consolidation wave ensued (Calomiris 1993). As the above discussion would lead one to expect, this consolidation saw banks taking an increased role in industrial lending—the origins of bank securities underwriting through affiliates—and the rapid growth of bank involvement in trust management. There was also an unprecedented increase in the number of U.S. firms participating in the market for new equity issues in the late 1920s. These progressive trends were halted by regulatory intervention during the Great Depression, based on the (now discredited) view that speculative behavior by large banks, and particularly their involvement in securities markets, had precipitated the Depression (Calomiris and White 1994).

Subsequent institutional innovations outside and inside the banking system helped to reduce corporate finance costs (Calomiris and Raff 1995). Beginning in the 1930s, life insurance companies became involved in financing corporations by purchasing privately placed debt (in essence a concentrated, nonpublic issue of a bond). Private placements accounted for roughly half of all securities issues during the 1940s and 1950s.

In the 1960s, as private pensions and mutual funds developed, they took on an important role as concentrated purchasers of new public offerings of stock. Mendelson (1967) and Calomiris and Raff (1995) argue that the involvement of these institutional investors substantially reduced the cost of bringing equities to market in the United States.

Beginning in the 1970s, regulations guiding bank holding companies were relaxed, and the laws governing pension fund investments were changed, enabling a new partnership to form between banks and institutional investors in the form of venture capital affiliates of commercial banks. Venture capital investments by bank affiliates financed themselves largely through institutional investors' equity stakes in the fund. Often, institutional investors are involved in holding stakes in venture capital investments in firms, and then continue their involvement as purchasers of equity once firms go public.

In the 1980s, in response to severe banking distress throughout the country, federal and state laws restricting bank consolidation were relaxed, prompting a second wave of bank consolidation. In the late 1980s the Federal Reserve Board (acting out of concern for the competitive viability of U.S. banks and with the approval of the courts) began to relax restrictions on the underwriting of corporate debt and equity by bank holding company affiliates or subsidiaries. Currently, legislation is pending in Congress that would repeal the Glass-Steagall separation between commercial and investment banking.

All of these institutional innovations have helped to concentrate corporate lending, stock ownership, and underwriting, thereby allowing the advantages of "relationship banking," the concentration of financial claims, and the synergies of universal banking to be realized. A combination of macroeconomic distress, international competitive pressure, and the creative invention of new intermediaries has helped the U.S. financial system to overcome the regulatory mandate of financial fragmentation in recent decades. The lesson for developing countries seeking to design their financial systems seems clear: avoid the lengthy and costly detour of U.S. financial fragmentation.

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Table 7.1

Investment Banking Costs in the United States Before World War II

(percentage of issue)

	1925-1929			1930s		
	Common	Preferred	Bonds	Common	Preferred	Bonds
Issues < $5 mill.				1935-38	1935-38	1935-38
Total Costs	—	8	6	18	10	5
Compensation	14-23	7 5	16	9	4	
Other Expenses	—	1	1	2	1	1
No. of Issues	—	96	423	241	206	210
All to Public, IBs[a]				1938	1938	1940
Total costs	—			22	12	
Compensation	9-23			20	11	2
Other expenses	—			2	1	1
No. of Issues	—			68	37	76
All to Public, IBs[a]						
Total cost, underw. issues				23 (16)	4 (9)	3 (31)
Total cost, best-efforts[b]				21 (52)	14 (28) 16 (1)	

— Not available.

a. All issues of securities to the public transacted through investment bankers.

b. Best-effort issues are placed by investment bankers without price guarantees.

Source: Stock issue cost ranges for the 1920s are from Calomiris and Raff (1995, table 4-9). All other data are from Calomiris (1995:296).

Table 7.2

Costs of Flotation of Primary Common Stock Issues Offered Through Dealers, Post-World War II

	Number of Issues	Average Cost (percentage of proceeds)
Issue < $5 million		
1935-1938	241	18
1945-1949	208	15
1951-1955	178	15
1963-1965	369	12
Issue > $5 million		
1940	11	12
1945-1949	49	8
1951-1955	52	6
1963-1965	107	7

Source: Calomiris (1995:299).

Table 7.3

Bankers' Commissions (Spreads) and Total Issuing Costs for German Common Stock Issues, 1893-1913

(percent)

	Mean Bank Spread	25th Percentile Bank Spread (%)	75th Percentile Bank Spread (%)	Mean Total Cost (%)	25th Percentile Total Cost (%)	75th Percentile Total Cost (%)
All Issues						
Electric.	3.67	2.57	4.55	5.08	3.61	7.00
No. of Firms	13	—	12	—	—	
No. of Obs.	21	—	20	—	—	
Manuf.	3.90	2.94	4.35	5.30	2.78	7.60
No. of Firms	19	—	15	—	—	
No. of Obs.	30	—	20	—	—	
Issues < 1 mill.						
Electric.	3.94	3.49	4.26	5.24	4.00	6.72
No. of Firms	4	—	3	—	—	
No. of Obs.	7	—	—	3	—	—
Manuf.	3.45	2.78	3.86	5.29	3.33	6.92
No. of Firms	10	—	10	—	—	
No. of Obs.	18	—	15	—	—	
1913 Capital < 2 mill.						
Manuf.	4.11	3.57	4.80	5.93	3.33	8.80
No. of Firms	3	—	5	—	—	
No. of Obs.	6	—	— 5	—		

— Not available.

Note: Bankers' spreads are defined as the difference between the amount paid for an issue by purchasers and the amount paid by the banker to the issuing firm divided by the total amount paid for the issue. Percent total costs are the net funds raised by the firm (net of all expenses, including taxes, printing costs and commissions) divided by the amount paid for the issue. Data are for firms that reported such information in *Saling's Borsen Jahrbuch* (1913) in the electrical industry (electrical equipment producers and power plant operators) and the metal manufacturers industry. The sample includes all reporting firms in the electrical industry and all reporting firms whose names begin with A through K for the metals manufacturing industry.

Source: Data are taken from Calomiris (1995:294).

Table 7.4

Nonagricultural Growth in Germany and the United States

	Germany		United States		
	Nonag.NNP (mill. marks 1913 prices)	Nonag.labor (thousands)	Nonag.value added (mill. dollars 1879 prices)	Nonag.net income (mill. dollars 1869 prices)	Nonag. Labor (thousands)
1849			670		
1850	5,052				
1869			1,550	5,325	6,193
1870	8,431				
1871		8,796			
1889				7,543	12,540
1890	15,857	12,807			
1910-13				16,519	20,871
1913	37,210	20,267			

Source: Calomiris (1995:279).

Table 7.5

Components of Tangible Reproducible Assets

(percent)

	Germany (1913)	United States (1912)
Dwellings	25	24
Other structures	31	35
Equipment	26	13
Inventories	10	10
Livestock	5	5
Consumer durables	3	13

Source: Goldsmith (1985:111).

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